R E P O R T R E S U M E S

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LEARNING TO READ SCIENTIFIC RUSSIAN BY THE THREE QUESTION EXPERIMENTAL (3QX) METHOD.

BY- ALFORD, M.H.T.

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A NEW METHOD FOR LEARNING TO READ TECHNICAL LITERATURE IN A FOREIGN LANGUAGE IS BEING DEVELOPED AND TESTED AT THE LANGUAGE CENTRE OF THE UNIVERSITY OF ESSEX, COLCHESTER, ENGLAND. THE METHOD IS CALLED "THREE QUESTION EXPERIMENTAL METHOD (3QX)," AND IT HAS BEEN USED IN THREE COURSES FOR TEACHING SCIENTIFIC RUSSIAN TO PHYSICISTS. THE THREE QUESTIONS--WHAT, HOW, AND WHEN TO LEARN--ARE CONSIDERED FOR EVERY DETAIL WHICH STUDENTS WILL ENCOUNTER AND PRECISE INSTRUCTIONS ARE GIVEN TO ATTAIN OPTIMUM PERFORMANCE. THE ANSWERS TO THESE QUESTIONS ARE DECIDED ON THE BASIS OF COMPUTER ANALYSIS OF THE TARGET LITERATURE AND ON LEARNING PROCEDURES DERIVED FROM EXPERIMENTAL PSYCHOLOGY. IN THE 3QX METHOD, VOCABULARY LEARNING IS TAKEN AS THE MAJOR SUBJECT SINCE IN ANY SPECIALIZED LITERATURE THE 1,000 MOST COMMON WORDS COVER ABOUT 90 PERCENT OF THE TEXT. THE PHYSICS COURSE BEGINS WITH A FIVE-HOUR INTRODUCTION TO THE RUSSIAN ALPHABET, PRONUNCIATION, WORD FORMATION, AND TECHNIQUES OF MEMORIZATION. STUDENTS THEN LEARN THE FIRST 500 DIFFERENT WORDS WHICH ARE USED EXCLUSIVELY IN AN ELEMENTARY RUSSIAN TEXTBOOK ON THE STRUCTURE OF THE ATOM. LEARNERS CAN START READING THE TEXT IMMEDIATELY AFTER THE WORDS ARE MEMORIZED (15 HOURS OF STUDY IN THREE WEEKS, ONE HOUR A DAY) AND ARE ABLE TO DEDUCE CONTEXT FROM THE VOCABULARY AND FROM THEIR SUPERIOR KNOWLEDGE OF THE SUBJECT MATTER. THE RUSSIAN IS READ THROUGH A GRILL WHICH CAN BE MOVED TO SHOW THE ENGLISH EQUIVALENT, THE GRAMMATICAL FUNCTION, AND THE DICTIONARY FORM OF EVERY WORD USED. IN ADDITION, THE 1,026 MOST FREQUENTLY USED WORDS IN RUSSIAN THEORETICAL PHYSICS HAVE BEEN PREPARED FOR MEMORIZATION ON CARDS. A SECOND TEXT, ON RADIOACTIVITY, IS BEING PREPARED FOR FURTHER PRACTICE IN DEDUCTION. IT IS PLANNED TO EXTEND WORK TO RUSSIAN CHEMISTRY AND MATHEMATICS. AT SOME TIME IN THE FUTURE THE CARD SYSTEM OF LEARNING IS LIKELY TO BE SUPPLEMENTED OR SUPPLANTED BY A COMPUTER WHICH WILL MEASURE THE SPEED AT WHICH THE LEARNER REMEMBERS THE MEANING OF EACH ITEM. THIS ARTICLE APPEARED IN "THE LINGUISTIC REPORTER," FEBRUARY, 1968, PUBLISHED BY THE CENTER FOR APPLIED LINGUISTICS, 1717 MASSACHUSETTS AVE., N.W., WASHINGTON, D.C. 20036. (JD)

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Learning to Read Scientific Russian by the Three Question Experimental (3QX) Method

by M. H. T. Alford

[*M. H. T. Alford is a Research Fellow in the Language Centre at the University of Essex, Colchester, England.*]

The Office for Scientific and Technical Information has provided the University of Essex with a grant of £22,460 for the further development of a new method of learning to read foreign languages. As less than one percent of British scientists can read Russian, this language has been chosen as the principal model.

The name of the method describes how a course should be constructed and evaluated. The questions what, how and when to learn are considered for every detail which students will encounter, and precise instructions are given to individuals for them to attain their optimum performance. In these controlled circumstances the learning processes are measured and the efficiency of variations in technique can be assessed objectively. It is, therefore, possible to organize continual improvement. A recent course at the University of Essex was the third to be held and each has seen the introduction of new ideas and the retention of those which lead to better results.

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The questions what, how and when to learn are inter-related. The answers are decided on the basis of computer analysis of the target literature and on learning procedures derived from experimental psychology.

Computer data[1] show that even a single branch of one discipline may have a vocabulary of about 10,000 words. Compared with this there are only a few hundred points of grammar to be learnt. In traditional courses the grammar is taught and very little is done to ensure that vocabulary is mastered. It is assumed that students satisfy their lexical requirements from dictionaries. This procedure is extremely inefficient and involves wasting time on such a scale that very few scientists are able to complete the task.

In the 3QX method vocabulary learning is taken as the major subject and pursued systematically. In any specialised literature the 1,000 most common words cover about 90 percent of the text. If these are learnt, the chances of being able to deduce the many thousands of uncommon low-frequency words are greatly increased. In addition, the chances of being able to deduce the grammar are much improved.

The 3QX method has already had great success in promoting vocabulary learning and it is now possible for students to learn more than 1,000 words without difficulty in a small number of hours of employed time. The only high-frequency data available at the present time are in Russian Theoretical Physics. For this reason, the course in use at Essex is for physicists. It has, however, been arranged to be suitable for chemists. Mathematicians have also participated and achieved some of the best results. Later, separate courses will be provided for each discipline.

The Physics course is based on a chapter in an elementary Russian textbook on the structure of the atom. After a five-hour introduction to the alphabet pronunciation, word formation and techniques of memorization, students begin learning the 500 different words which give complete coverage of the first 2,000 words of text. With the aid of specially

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prepared cards this takes about 15 hours (more or less depending on the memorizing ability of each individual). Efficiency requires the work to be spaced at one hour a day for five days a week. The first three weeks of the course cannot, therefore, be intensive.

After this initial period students begin reading the text. This has been selected to contain words essential to advanced physics while only dealing with simple concepts. Learners thus start reading after a few hours' study and are able to deduce context from the vocabulary they have learnt and from their superior knowledge of the subject matter. These conditions are highly advantageous for studying grammar and, after the first 2,000 words of text, for adding to vocabulary.. These processes are assisted by the layout of the text and supporting matter. The Russian is read through a grid which can be moved to show the English equivalent, the grammatical function, and the dictionary form of every word. The instructions for the operation of the grid are designed to promote learning by attempted remembering and by deduction.

The vocabulary which the physicists learn in the course is larger than that acquired by traditional methods, but it is still too small for professional reading without excessive use of a dictionary. Accordingly, the 1,026 most frequently used words in Russian theoretical physics [2] have been prepared for memorizing. The system is the same as in the learning of the text vocabulary. Each word is on a card and supported by mnemonic data. Known words can be quickly eliminated and the strange ones are then learnt to the desired criterion. On completion, the student's vocabulary will give him over 90 percent coverage of papers in this particular field.

A second text, on Radioactivity, is now being prepared. This is in a two-line format with English equivalents under each Russian word. The English line, which is normally covered by a grid, also has notes on obscure points of grammar in the Russian line. Physicists will use this text for further practice in deduction and for extending their knowledge without having to use inefficient reference works.

A computer program is now being prepared for ascertaining the high-frequency vocabularies in each important research area in contemporary Russian physics. Tape punching commenced in Autumn 1967, and the first data will probably be available early in 1968.

Each of these word frequency lists will be prepared for learning in a manner similar to that employed for the theoretical physics vocabulary. The system is flexible; however much or little the student knows, the material can quickly be adapted to his personal needs.

The OSTI grant also makes provision for the punching of texts in Russian chemistry and mathematics. This work will probably begin in early 1968 and later the high-frequency vocabularies in various research areas will be prepared for memorizing. Consequently, chemists and mathematicians who attend the present physics course will be acquainting themselves with the techniques required to make use of this material.

At some time in the future the card system of learning is likely to be supplemented or supplanted by a computer. This will present the card data on a screen and measure the speed at which a learner remembers the meaning of each foreign word or phrase. This response latency will be used to regulate when a particular item reappears. Adjustment of learning to response times will make it possible to ensure long or short retention as required by post-instructional circumstances.

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1. All computer data used so far at the University of Essex have been published by the RAND Corporation, California, whose help is gratefully acknowledged.

2. Published in RAND Memorandum RM-3383-PR, October 1962, *High Frequency Words and Occurrence Forms in Russian Physics*, by A. S. Kozak.

Ford Foundation Grants for Linguistics and English-Language Training

Early in January the Ford Foundation announced a series of grants in support of programs and projects involving linguistics and English as a foreign language. The actions include the Foundation's first grants to Indonesia since it closed its Jakarta office in 1965 because of adverse operating conditions.

Research Foundation of the State University of New York—$245,000 grant, for an emergency training program for Indonesia's English-language secondary-school teachers. Shortly after Indonesia won its independence from The Netherlands in 1949, it officially adopted English as its first foreign language, and since the early 1950s, the Foundation has assisted Indonesian efforts to teach English. It has provided consultants from abroad to help work out a system of instruction and to develop teaching materials. In 1959, the Foundation began a series of grants to the State University of New York to assist the development of a graduate English school at the Institute of Education in Malang, in East Java. The Malang program aims to train Indonesian university and college faculty members for English teacher training programs. Total support for these projects amounted to $1,686,300.

The new funds will be used for an emergency upgrading program for English-language secondary-school teachers. They will receive instruction at a center that will be moved every six months to a new location so that a maximum number of participants can be accommodated. The Foundation will provide foreign specialists, equipment for a language laboratory, and support for workshops, seminars, and curriculum planning. It will also provide equipment to help move the language laboratory to the center's various locations.

University of Hawaii—$50,000 grant, for a sociolinguistic study of the language problems of developing countries to be conducted at the University's East-West Center by a team of scholars from various nations.

Survey of language use and language teaching in Eastern Africa—three grants totaling $337,555 for major sociolinguistic studies of the six East African nations. In the area, many African vernaculars, some Indian languages, and English are spoken; choices of languages to be used by new nations are among the most crucial and controversial that can be made. To provide information on which such decisions can be based, the studies will be conducted in two countries each year. In addition, African linguists will be sent abroad for training and linguistic research will be supported at African universities. The University of California received $139,745 to provide staff and

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prepared cards this takes about 15 hours (more or less depending on the memorizing ability of each individual). Efficiency requires the work to be spaced at one hour a day for five days a week. The first three weeks of the course cannot, therefore, be intensive.

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